

A new Neotropical species of *Megamelus* and the reassignment of *Stenocranus maculipes* (Hemiptera: Delphacidae)

MARIANI, Roxana¹, Alejandro J. SOSA² & Ana M. M. de REMES LENICOV¹

¹División Entomología, Museo de La Plata, Paseo del Bosque s/n, B1900DNG La Plata, Argentina. E-mail: rmariani@fcnym.unlp.edu.ar

²Fundación para el Estudio de Especies Invasivas (FuEDEI), General Simón Bolívar 1559 (1686), Hurlingham, Buenos Aires, Argentina. E-mail: alejsosa@fuedei.org

Una nueva especie neotropical del género *Megamelus* y nueva combinación para *Stenocranus maculipes* (Hemiptera: Delphacidae)

RESUMEN. Se estudian dos especies de Delphacidae que habitan en humedales de la Argentina, *Megamelus nigrifasciatus* Mariani & Remes Lenicov sp. nov. y *Megamelus maculipes* (Berg) comb. nov. La primera fue colectada sobre *Eryngium* sp. (Apiales: Apiaceae) y se describe a partir de formas braquípteras de ambos sexos. Además, se propone a *Stenocranus maculipes* (Berg, 1879), colectada en *Echinodorus grandiflorum* (Alismataceae), como *Megamelus maculipes* comb. nov. Se redescrive el holotipo hembra macróptero y se describen por primera vez los braquípteros de ambos sexos. Se aportan datos distribucionales y biológicos de las especies tratadas y se menciona por primera vez al género *Eryngium* como hospedante del género *Megamelus*. Asimismo, se provee una clave para la identificación de las siete especies sudamericanas de *Megamelus*.

PALABRAS CLAVES. *Megamelus nigrifasciatus*. *Megamelus maculipes*. Apiaceae. Alismataceae. América del Sur.

ABSTRACT. We report on two species of Delphacidae from Argentine wetlands, *Megamelus nigrifasciatus* Mariani & Remes Lenicov sp. nov. and *Megamelus maculipes* (Berg) comb. nov. The first species was collected from *Eryngium* sp. (Apiales: Apiaceae) and was described from the brachypters of both sexes. The second one, *Stenocranus maculipes* (Berg, 1879) collected from *Echinodorus grandiflorum* (Alismataceae), is proposed as *Megamelus maculipes* comb. nov. The female macropter holotype is redescribed and the male and female brachypters are described for the first time. Geographic distribution and biological data of both species are reported. The genus *Eryngium* is cited for the first time as host plant for the genus *Megamelus*. Additionally, a key is provided to distinguish among the seven South American species of *Megamelus*.

KEY WORDS. *Megamelus nigrifasciatus*. *Megamelus maculipes*. Apiaceae. Alismataceae. South America.

INTRODUCTION

The genus *Megamelus* Fieber (Hemiptera: Delphacidae) is characterized by a narrow head, long vertex extending beyond the eyes,

and the lobed appearance of the male pygofer (Beamer, 1955). It is represented in the Americas by 25 species, five of which occur on three aquatic plant families from South American wet-

lands: *Megamelus bellicus* Remes Lenicov & Sosa on *Pontederia cordata* L., *P. rotundifolia* L., *Eichhornia crassipes* (Martius) Solms-Laubach, *E. azurea* Kunth (Pontederiaceae) and *Echinodorus grandiflorum* (Chamisso & Schlechtendal) (Alismathaceae); *M. electrae* Muir on *E. crassipes* and *E. azurea*; *M. iphigeniae* Muir on *P. parviflora* Alexander, *E. crassipes* and *E. azurea*; *M. scutellaris* Berg 1883 on *E. crassipes*; and *M. timehri* Muir on *Limnobia spongia* (Bosc) Steudel subsp. *laevigatum* (Humboldt & Bondpland ex Willdenow) (Hydrocharitaceae) (Sosa *et al.*, 2004; Sosa *et al.*, 2007a).

Due to the interest sparked by *M. scutellaris*, a South American species released in the USA as a biocontrol agent against *E. crassipes* (Sosa *et al.*, 2007b; Tipping *et al.*, 2011, Fitzgerald & Tipping, 2013), much more attention has been paid to this genus, its biology and host plants in the Neotropics. Several specimens of *Megamelus* spp. were collected from *Eryngium* sp. (Apiaceae) and *E. grandiflorum* (Alismataceae) in recent explorations of Argentinian wetlands. These studies revealed the new species *Megamelus nigrifasciatus*, described herein, and suggested the new combination *Megamelus maculipes*, based on examination of the female macropter holotype and the description of the previously unknown male and female brachypters. A key for the South American species, modified from Sosa *et al.* (2007a), is also presented here to facilitate species identification. Data on distribution and biology are included, highlighting the discovery of *Eryngium* sp. as a new host plant for the genus *Megamelus*.

MATERIAL AND METHODS

Morphological studies

The adults examined came from field surveys in the Paraná–Uruguay Basin wetlands (approximate range 25°–35° S) (according to Bonetto & Hurtado, 1998) in Argentina, made from 1999 to 2007. A few specimens belong to the collections of Museo de La Plata (MLP) (FCNyM-UNLP), Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires (FCEyN), the field specimens were collected directly from plants using insect aspirators.

The male brachypter of *M. nigrifasciatus* sp. nov. was described in detail, while only major morphological traits were considered for the

female brachypter. To preserve the unique type specimen of *M. maculipes* comb. nov. (no. 1706 MLP collection), the description was based only on external anatomical features, the sixth sternite, the outline of valvifer VIII and the length of the ovipositor. In addition, female macropters and brachypters and male brachypters captured in the vicinity of the type locality, and structurally identical — in coloration pattern and anatomical features — to the type specimen, were used for dissections, illustrations and complementary descriptions.

Male and female genitalia were prepared for microscopic examination. Illustrations were drawn using a stereoscopic microscope with camera lucida. Measurements were taken from ten specimens of each sex, with winged forms included when possible, and are given in millimeters, with the average followed by the range in parentheses. Abbreviations are as follows: L., total length; B.L., body length; t.l., tegmina length; v.l., vertex length; v.w., vertex width at base; f.l., frons length; M.f.w., maximum frons width; m.f.w., minimum frons width; a.l.I, first antennal segment length; a.l.II, second antennal segment length; p.l., pronotum length; m.l., mesonotum length; mti.l., metatibia length; mta.l., metatarsi length; mta.I, first hind tarsomere length; s.l., metatibial spur length; t.n., number of teeth on metatibial spur.

Specimens were deposited in the MLP collection. Label information for primary types is quoted, with each line break indicated by “/” and each label separated by “//”.

Laboratory rearing

Adults were collected in the provinces of Entre Ríos and Buenos Aires (Argentina), during surveys that took place in 1999, 2001, 2002, 2004 and 2007. Specimens were transported alive to the FuEDEI, where several generations of *M. nigrifasciatus* and *M. maculipes* were reared on *Eryngium* sp. and *E. grandiflorum*, respectively, using potted plants placed in three 300-liter canvas pools, under outdoor conditions. Some host plants were reared separately and analyzed under the microscope to search for oviposition marks, some of which were later isolated to obtain egg parasitoids. Preliminary host range studies were performed by adding other species of aquatic plants: the Pontederiaceae *P. cordata*, *P. rotundifolia*, *P. subovata*

(Seubert) Lowden, *E. crassipes*, *E. azurea*, and *Heteranthera limosa* (Swartz) Willdenow, and the Hydrocharitaceae *L. laevigatum*. Further observations of adults, nymphs and ovisposition scars were made on all plants.

RESULTS

***Megamelus nigrifasciatus* Mariani & Remes Lenicov sp. nov.** (Figs. 1–14)

Male brachypter (Figs. 1–11). Color: brown. Vertex lighter, darker spots on base, middle and apex of lateral carinae, and apex of submedian carinae on fastigium. Frons lighter, with small irregular darker spots on base, followed by two narrow irregular stripes extending towards the gena, one whitish, one blackish, and a third, regular wider whitish stripe at apex. Clypeus dark brown at base and laterally. First antennal segment darker than second, with a median blackish stripe frontally. Pronotum lighter between lateral carinae near the vertex; mesonotum whitish (Figs. 1–2). Tegmen light brown with claval and apical margins white, with two dark spots on the claval margin (Fig. 3). Legs yellow, darker on central area of pro and mesocoxae; lateral and apical area of femur; annular stripes near base and apex of pro and mesotibia; spot on the base of the metatibia, and two annular stripes one near base and the other on the base of the apical spines; base of spurs, base of the first and apex of third tarsomere. Abdomen, in dorsal view, lighter along midline, with contrasting white spots on side of tergites 3–5; pygofer light brown to yellowish on dorsal surface continuing onto anal segment, outer lobes reddish, inner lobes darker; anal segment dorsally and laterally yellowish, ventral margin and anal style brown.

Structure. Vertex rectangular, longer than wide (1.5:1) projecting beyond eyes about one-third of its length, basal compartment occupying approximately more than basal third, conspicuous submedian carinae forming narrow triangular area towards the fastigium (Fig. 1). Frons twice longer than wide (2:1), strongly narrower between anterior margins of eyes, maximum width near basal half, lateral margins slightly convex at apex, carinae well developed, median one forked at the fastigium. Clypeus subtriangular, longer than wide, median carina

weaker basally. Rostrum reaching metacoxae, longer than frons, subapical segment longer than apical one (1.16:1). Antennae with first segment 2 times longer than wide, second segment 1.25 times the first, length twice and half its width (Fig. 2). Pronotum with conspicuous carinae, laterals divergent, straight to slightly convex, reaching hind margin. Mesonotal disc almost as long as pronotum, carinae conspicuous, lateral ones reaching hind margin (Fig. 1). Metatibial spur leaf-like, short and narrow, with a median longitudinal rib, bearing 10–13 black-tipped regular teeth on trailing margin, almost one quarter shorter than first segment of metatarsi; first hind tarsomere longer than the second plus third (2:1) (Fig. 4 a–b).

Terminalia (Figs. 5–11). Pygofer dorsally with shallow concave anal emargination, anal angles rounded, slightly projected caudad (Fig. 6); ventral margin with large round kidney-like outer lobes, partially enfolding lateral area of pygofer (Fig. 5), rhomboid shaped inner lobes—acute in outline—, emarginated and depressed between inner and outer lobes (Fig. 7); diaphragm short, dorsal margin medially produced to a semi-conical and truncated process (Figs. 6–8). Aedeagus very long, regularly tubular, slightly narrowing apically, strongly curved dorsad, apex bearing a long closely curved thin spine-like process to left above phallotreme; phallotreme large, near apex on ventral surface (Fig. 9). Suspensorium sclerotized, strap-like, very long and sinuous— $2/3$ of aedeagus length—, flattened and widened in the middle third (Fig. 5). Genital styles long, straight, inner margin slightly concave basally, apex hook-like (Fig. 10). Anal segment collar-like, closely embraced by the pygofer, with two long slender symmetrical spine-like processes strongly curved upwards, projecting to each side at the middle of the ventral surface (Fig. 11); anal style short, two times longer than wide (Figs. 5–11).

Measurements (n = 10). B.L., 2.77 (2.95–2.6); t.l., 0.97 (1–0.95); v.l., 0.415 (0.43–0.4); v.w., 0.26 (0.28–0.22); f.l., 0.62 (0.64–0.6); M.f.w., 0.31 (0.32–0.3); m.f.w., 0.155 (0.16–0.15); a.l.I, 0.225 (0.25–0.2); a.l.II, 0.335 (0.37–0.3); p.l., 0.325 (0.35–0.3); m.l., 0.34 (0.38–0.3); mti.l., 1.07 (1.13–1.02); mta.l., 0.78 (0.8–0.75); mta.I, 0.525 (0.55–0.5); s.l., 0.412 (0.425–0.4); t.n., 10–13.

Female brachypter. Body coloration pattern

and structure similar to male; ovipositor brown, valvifer VIII and apex of gonapophysis VIII yellowish. Metatibial spur with 11–14 teeth.

Genitalia (Figs. 12–14). Ovipositor short, reaching anal segment at base (Fig. 12). Sternite VII membranous, finely sculptured. Valvifer VIII regularly broad, with a long and curved basal projection, in ventral view separated at rest; cuticle finely denticulated at basal surface (Fig. 13). Gonapophysis VIII without median process at base. Gonapophysis IX lightly curved at base, bearing numerous strong teeth on dorsal margin towards apex for half of its length, teeth smaller and closer distally; with few ventral teeth (Fig. 14).

Measurements (n = 10). B.L., 3.6 (3.7–3.5); t.l., 0.89 (0.93–0.87); v.l., 0.35 (0.38–0.32); v.w., 0.26 (0.27–0.25); f.l., 0.63 (0.65–0.625); M.f.w., 0.315 (0.33–0.3); m.f.w., 0.157 (0.165–0.15); a.l.I, 0.262 (0.275–0.25); a.l.II, 0.362 (0.375–0.35); p.l., 0.32 (0.33–0.31); m.l., 0.362 (0.375–0.35); mti.l., 1.2 (1.25–1.15); mta.l., 0.95 (1–0.9); mta.l., 0.612 (0.625–0.6); s.l., 0.415 (0.43–0.4); t.n, 10–13.

Notes on Biology. This planthopper was recorded in Otamendi, Paraná River delta, in the province of Buenos Aires (Argentina). It was collected on *Eryngium* sp. (Apiaceae), a plant growing on the higher areas of river banks, where it is protected from periodical floods. The insects were found in the center of the plant mat, where these plants tend to accumulate water. Large numbers of nymphs and brachypters adults were found.

In the laboratory, *M. nigrifasciatus* always preferred *Eryngium* sp. as host even though it was in contact with other plants. Although they were reared in the laboratory, no macropters were obtained. Oviposition occurred at the base of the leaves; oviposition scars were simple incisions. No parasitoid was recorded.

Etymology. The specific name comes from the Latin word *nigrum* and *fascia*, in a reference to the black stripe on the genal area which extends to the first antennal segment.

Geographical Distribution. ARGENTINA: Buenos Aires province.

Type material examined. HOLOTYPE male (brachypter): ARGENTINA. Buenos Aires: Otamendi, 7-XII-2007, on *Eryngium* sp., Sosa col. (MLP). **Paratypes: ARGENTINA.** Same data as holotype, 10 male brachypters (2 with

genitalia dissected), 10 female brachypters (3 with genitalia dissected) (MLP).

Other materials examined. ARGENTINA: same data as holotype, 12 male brachypters (2 with genitalia dissected), 8 female brachypters, (4 with genitalia dissected) (MLP).

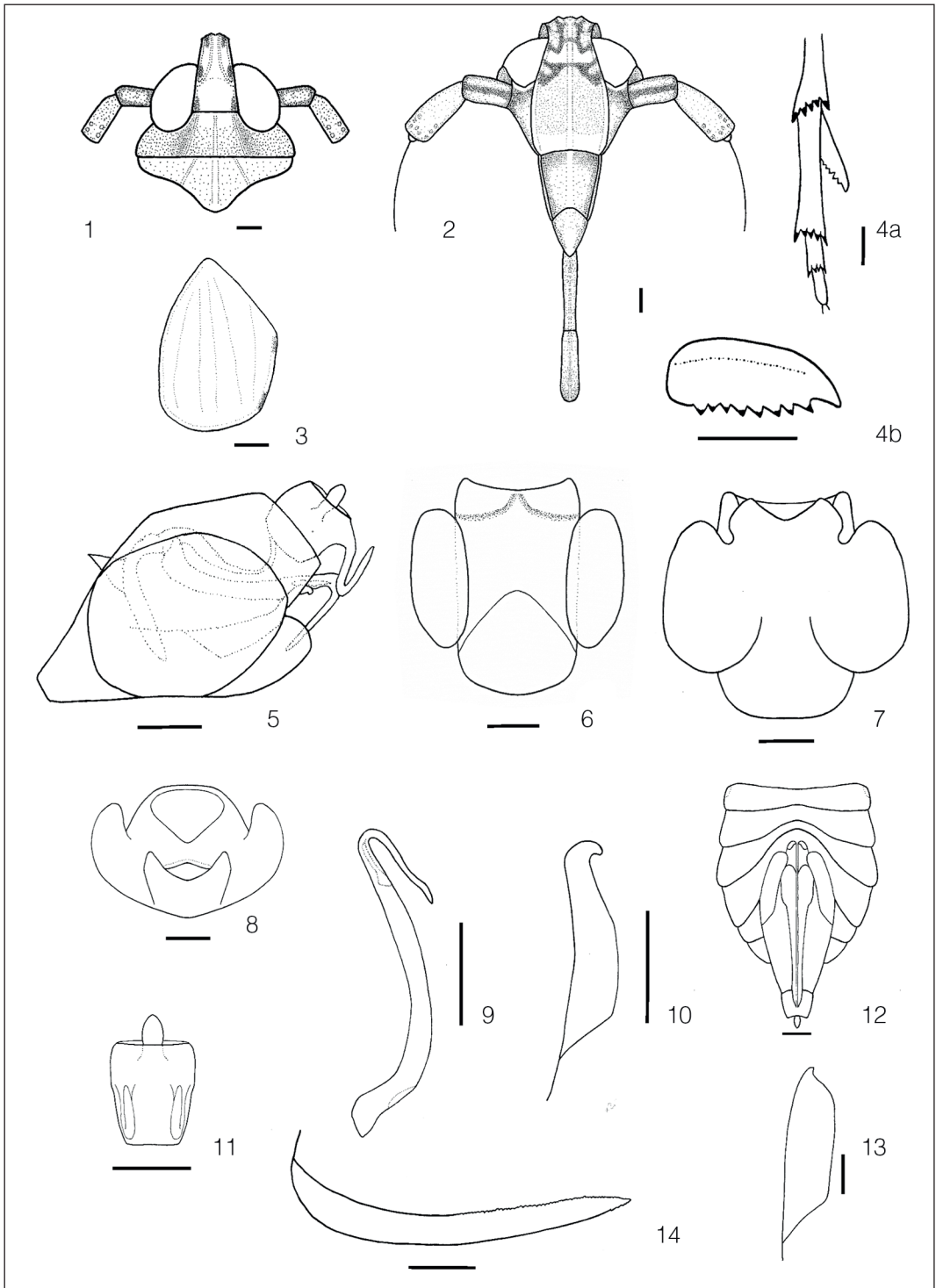
Remarks. *Megamelus nigrifasciatus* can be easily distinguished from the remaining South American species by the following combination of characters: head coloration pattern with dark and whitish stripes; aedeagus long and curved, anal segment with slender, long and symmetrical processes in male; stronger and acute teeth on the gonapophysis IX in female. It is similar to *M. timehri* by the shortened vertex and frons, the possession of one strong curved apical process on the aedeagus of males and an anal segment with two symmetrical processes.

***Megamelus maculipes* (Berg) comb. nov.** (Figs. 15–28)

Delphax maculipes Berg 1879: 223.

Stenocranus maculipes: Berg 1883: 236.

Female holotype (Figs. 15–18, 26–28). Color: brown. Vertex light brown, lateral margin of basal compartment darker, with small dark brown spots on base of lateral carinae and apex of median carinae. Frons with small darker spots on base, two lighter transverse stripes, one in the middle portion extending below eyes to base of antenifer, the other one whitish, extending from apex of frons and base of clypeus towards gena. Clypeus with dark brown carinae in its middle portion. Antennae, first antennal segment light brown, darker on dorso-apical portion. Pronotum light brown between bases of lateral carinae (Figs. 15–16). Tegmina hyaline, fuscous along veins, infusate area between Cu vein and claval suture, on M1, M2 and M 3+4 veins, last two apical cells, and apex of clavus (Fig. 17). Legs light brown, dark marks on middle of procoxae, near base and apex of mesocoxae, longitudinal stripes in both sides of femora; two annular stripes near base and apex of tibiae respectively, and basal portion of apical spines of metatibia, tarsomere I and apical half of tarsomere III, basal portion of metatibial spur. Abdomen brown, tergites lighter in the midline towards anal segment. Ovipositor light brown; valvifer VIII internally, and apical portion of pygofer light brown to yellowish.



Figs. 1–14. *Megamelus nigrifasciatus* Mariani & Remes Lenicov sp. nov. 1, head and thorax, dorsal view; 2, head, frontal view; 3, tegmina; 4 a–b, metatibial spur; 5, male terminalia, lateral view; 6, pygofer, dorsal view; 7, pygofer, ventral view; 8, diaphragm of pygofer, caudal view; 9, aedeagus, posterior view; 10, left genital style; 11, anal segment, ventral view; 12, female abdomen, ventral view; 13, left valvifer VIII, ventral view; 14, gonapophysis IX, right lateral view. (Scale = 1mm).

Structure. Vertex rectangular, longer than wide (2:1) projecting beyond eyes more than one-third of its length, basal compartment occupying approximately basal third, very conspicuous carinae, submedian ones forming a narrow triangular area continuing just beyond fastigium (Fig. 15). Frons two and a half times longer than wide (2.5: 1), narrower between anterior margins of eyes, lateral margins divergent towards apex, slightly arcuate, carinae well-developed, median one forked at fastigium. Clypeus subtriangular, longer than wide, carinae prominent. Rostrum reaching metacoxae, as long as frons, subapical segment longer than apical (1.25:1). Antennae, first segment length three times its width, compressed laterally and oval in section; second segment one quarter longer than first, and three times its width (Fig. 16). Pronotum with conspicuous carinae, laterally divergent, straight to slightly convex, reaching posterior margin. Mesonotum almost as long as vertex plus pronotum, median carina becoming obsolete at apex, lateral carinae inconspicuous, slightly divergent posteriorly, not reaching posterior margin (Fig. 15). Metatibial spur leaf-like, with longitudinal rib, bearing 20 black-tipped teeth on trailing margin, one quarter shorter than first segment of metatarsi; first hind tarsomere longer than second plus third (1.5: 1) (Figs. 18 a–b).

Genitalia (Figs. 26–28). (Redescription based on four specimens from Argentina, in addition to holotype). Ovipositor short, reaching anal segment at base (Fig. 26). Sternite VII membranous, finely sculptured, with small medially lobed projection. Valvifer VIII rather broad, inner margin produced and truncate at base, closed tightly at base in repose in ventral view (Fig. 27). Gonapophysis VIII with a dorsal median process tongue-like at base, 1.3 times longer than wide, hardly sclerotized, anterior and dorsally projected, J-shaped in lateral view. Gonapophysis IX lightly curved at base, bearing numerous small teeth on dorsal margin towards apex for more than half of its length, tip ventrally with more conspicuous teeth (Fig. 28).

Measurements (n = 5). B.L., 5.55 (5.7–5.4); B.L., 4.3 (4.4–4.2) ; t.l., 4.7 (4.8–4.6); v.l., 0.525 (0.53–0.52); v.w., 0.262 (0.275–0.25); f.l., 0.92 (0.94–0.9); M.f.w., 0.37 (0.39–0.36); m.f.w., 0.19 (0.2–0.18); a.l.I, 0.315 (0.33–0.3); a.l.II, 0.367 (0.375–0.36); p.l., 0.29 (0.33–0.26); m.l., 0.725

(0.75–0.7); mti.l., 1.262 (0.275–0.25); mta.l., 1.262 (1.275–1.25); mta.l., 0.725 (0.8–0.75); s.l., 0.575 (0.6–0.55); t.n., 20–24.

Male brachypter (Figs. 19–25). Color similar to macropter, tegmina amber with dark spots on apical and claval margin, pro and mesonotum brown, region between lateral carinae yellowish. Abdomen brown, with median longitudinal yellowish to light brown stripe extending to genital and anal segments; laterally limited by a pair of yellowish to whitish spots on tergites IV, V and VII, and an additional pair of yellow spots on lateral margin on V; pygofer rufous, light brown to yellowish on dorsal surface and ventral portion of lateral angles.

Structure. Mesonotum disc half as long as vertex plus pronotum, with long and curved basal projection, in ventral view separated in repose, median carina becoming obsolete by caudal third, lateral carinae conspicuous, slightly divergent posteriorly, reaching posterior margin.

Terminalia (Figs. 19–25). Pygofer dorsally with a markedly concave anal emargination, anal angles large, broadly rounded, distinctly projected caudad (Fig. 20); ventral margin with large round kidney-shaped outer lobes, partially enfolding lateral area of pygofer (Fig. 19), large inner lobes rounded in outline, area between them widely notched and ventrally depressed (Fig. 21); diaphragm short, dorsal margin medially produced to a semiconical and obliquely truncated process, irregular on apical edge (Figs. 20–22). Aedeagus long, regularly tubular, bearing a long spine-like semicircularly curved subapical process on the left, and a small sharp-pointed tooth above this process, phallosome suboval on dorsal surface near apex, one quarter of aedeagus length (Fig. 23). Suspensorium sclerotized, strap-like, short, less than half of aedeagus length (Fig. 19). Genital styles long, straight, flexed inwards midway, apex hook-like (Fig. 24). Anal segment collar-like, strongly excavated on ventral margin of apex and borderer, without processes (Fig. 25). Anal style long, more than four times its width (Figs. 19–25).

Measurements (n = 10). B.L., 3 (3.2–2.8); t.l., 0.925 (0.95–0.9); v.l., 0.412 (0.425–0.4); v.w., 0.212 (0.225–0.2); f.l., 0.78 (0.82–0.75); M.f.w., 0.26 (0.275–0.25); m.f.w., 0.187 (0.2–0.175); a.l.I, 2.11 (0.23–0.2); a.l.II, 0.24 (0.28–0.2); p.l., 0.24 (0.28–0.2); m.l., 0.337 (0.38–0.375); mti.l., 1.112 (1.125–1.1); mta.l., 1.112 (1.125–1.1);

mta.I, 0.61 (0.65–0.57); s.I., 0.61; t.n., 23–24.

Female brachypter. Body coloration pattern similar to male brachypter, genitalia similar to female macropter.

Measurements (n = 10). B.L., 4.3 (4.5–4.1); t.I., 1.09 (1.1–1.08); v.I., 0.52 (0.54–0.5); v.w., 0.262 (0.275–0.25); f.I., 0.825 (0.85–0.8); M.f.w., 0.325 (0.34–0.31); m.f.w., 0.165 (0.18–0.15); a.I.I, 0.25 (0.225–0.325); a.I.II, 0.33 (0.3–0.375); p.I., 0.28; m.I., 0.365 (0.38–0.35); mti.I., 1.125 (1.25–1); mta.I., 1.1 (1.2–1); mta.I, 0.64 (0.65–0.63); s.I., 0.625 (0.65–0.6); t.n., 21–23.

Notes on Biology. *Megamelus maculipes* was recorded during 1999–2004 on only one species of the family Alismataceae, *E. grandiflorum*. This plant grows on the margins of the rivers and channels of the Paraná River Delta. This region is frequently flooded, so that the plants remain underwater for varying periods. *Megamelus maculipes* was observed at the base or around the canopy, depending on the flooding regime.

In the laboratory this planthopper always preferred *E. grandiflorum* as host, even though this plant was in contact with other plant species.

The female inserted the eggs into the aerenchyma of the petiole, near the upper part of the plant. The scars were similar to those of *M. scutellaris* (Sosa *et al.*, 2005), and consisted of three parallel lines; the eggs were laid in the shorter middle line. No egg parasitoids have been recorded.

Geographical distribution. ARGENTINA: Entre Ríos and Buenos Aires provinces.

Type material examined. HOLOTYPE: *Typus* // **Buenos Aires** // *Delphax maculipes* / Berg // *Stenocranus maculipes* / Berg // N°1706 [blue paper] (female macropter MLP).

Other materials examined. ARGENTINA.

Buenos Aires: Otamendi, X-2004, on *E. grandiflorum*, Sosa col., 18 male brachypters (3 with genitalia dissected) and 25 female brachypters (4 with genitalia dissected), (MLP); INTA Delta, I-1973, Bachman col., 4 female macropters (FCEyN); Hurlingham, 5-IX-2001, *E. grandiflorum*, Sosa col., 1 male brachypter (with genitalia dissected). **Entre Ríos:** Villa Paranacito, 5-I-1999, on *E. grandiflorum*, Sosa col., 3 female macropters (MLP).

Remarks. In the original description Berg (1879: 223) mentioned that the single specimen of *Delphax maculipes* was received from Sr.

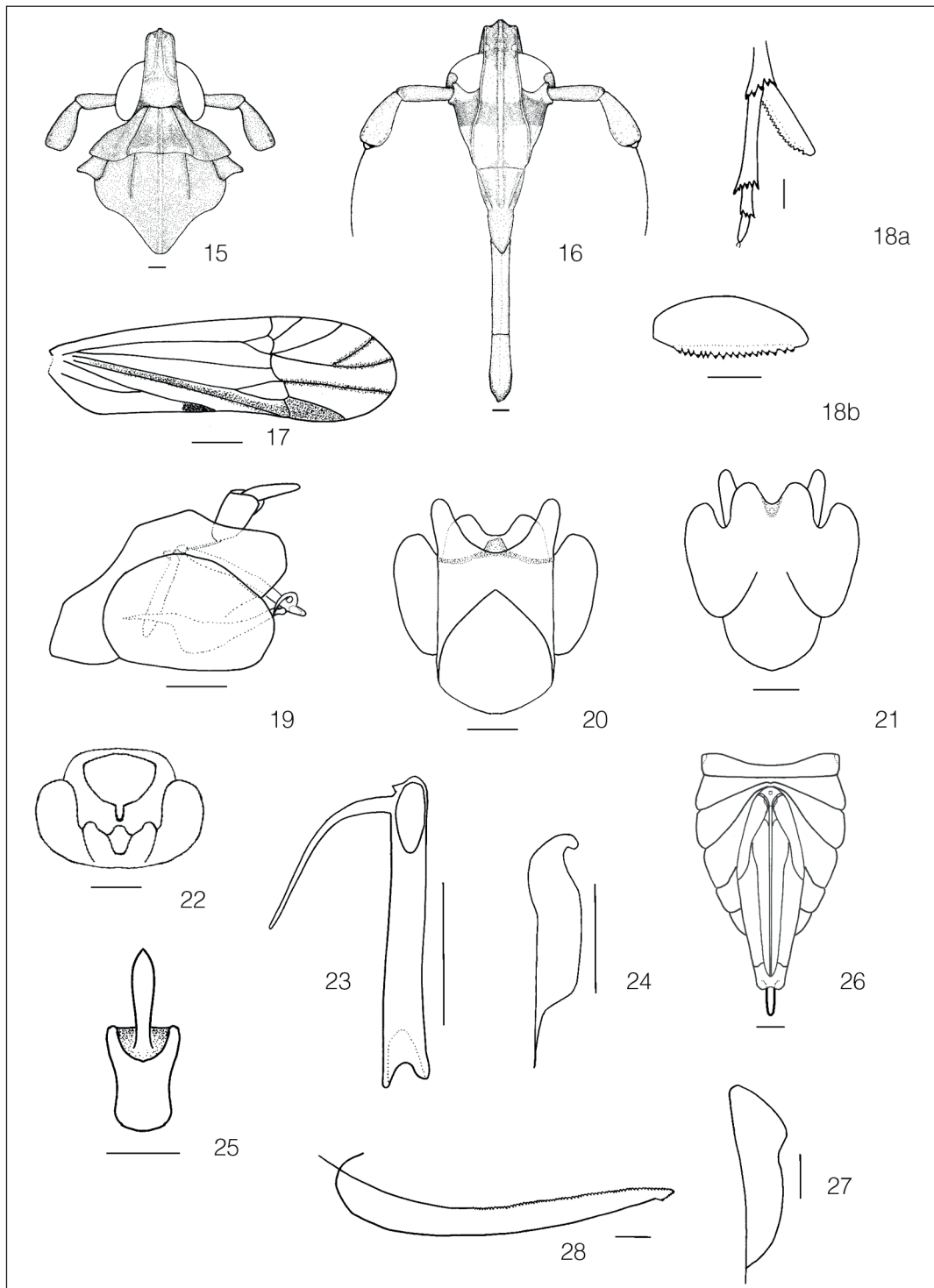
Ed. Lynch Arribalzaga and was collected in Río Luján during February, 1879; in 1883: 236, he transferred it to *Stenocranus* Fieber 1866 and labelled it as *S. maculipes* (Berg) Scott in litt., adding that the specimen had not been seen again after its description. Dozier (1922: 80–81) in the synopsis of the genus *Stenocranus* recognized this species, and translated the original Latin description into English; in addition, Crawford (1914: 591) and Metcalf (1943: 171) mention its distribution for Argentina. Recently Bartlett (2009), in the revision of New World Stenocraniidae, did not include it, commenting that this species would best be treated as *incertae sedis* until the male was located.

In this paper we transfer *Stenocranus maculipes* to the genus *Megamelus* based on the generic diagnostic characters *sensu* Beamer (1955), such as a narrow head, long vertex extending beyond the eyes, and the lobed appearance of the male pygofer. Because of the similarity between the type specimen and the females and males field collected on the same host plant and reared in the laboratory (unpublished data), we were able to recognize the male and winged morphs of this species.

Megamelus maculipes is easily distinguished from the other South American species of the genus by the long first antennal segment, the greatly concave anal emargination of the pygofer, the strongly excavated and bordered ventral margin of the anal segment, long anal style, left subapical process on the aedeagus, and the lobed small projection of sternite VIII, median process on the lateral gonapophysis VIII which are tongue shaped and J-shaped in lateral view. This species is similar to *M. scutellaris* in the general coloration pattern, unarmed anal segment and shortened ovipositor that does not reach the anal segment. However, it differs from the latter by its larger size, the rounded inner lobes of the pygofer in outline, the semiconical produced and truncated dorsal margin of the diaphragm of males; and the finely denticulated gonapophysis IX of females.

Key to *Megamelus* species from South America (Modified from Sosa *et al.* 2007a)

1. Male anal segment with two asymmetrical processes. Aedeagus with two curved processes on each side. Ovipositor long, reaching or



Figs. 15–28. *Megamelus maculipes* (Berg) comb. nov. 15, head and thorax, dorsal view; 16, head, frontal view; 17, tegmina; 18 a–b, metatibial spur; 19, male terminalia, lateral view; 20, pygofer, dorsal view; 21, pygofer, ventral view; 22, diaphragm of pygofer, caudal view; 23, aedeagus, posterior view; 24, left genital style, posterior view; 25, anal segment, ventral view; 26, female abdomen, ventral view; 27, left valvifer VIII, ventral view; 28, gonapophysis IX, right lateral view. (Scale = 1mm).

surpassing anal segment 2
 – Male anal segment with two symmetrical processes (Fig. 11) or without processes (Fig. 25). Aedeagus with one or two processes (Figs. 9, 23); if two, curved on same side. Ovipositor short, not reaching anal segment (Figs. 12, 26) 3

2. Processes of male anal segment slender, upwards and projecting inwards just below posterior angle. Aedeagus tubular, processes projected toward base. Pygofer with sclerotized area bearing a pair of small, sharp-pointed processes between inner lobes. Female: valvifer VIII with inner margin produced and truncate at base. Frons with one narrow light stripe on the apex, macropterous tegmina hyaline with only one fuscous mark on the apex of clavus ***M. bellicus***
 – Processes of male anal segment stronger, curved in opposing directions (left dorsad, right ventrad). Aedeagus asymmetric, with one process directed cephalad and other caudad; with small dorsal furcate projection near middle. Pygofer with lobe-like process between inner lobes. Female: valvifer VIII with inner margin rounded at base. Frons uniformly colored, macropterous tegmina heavily infuscated on clavus and apical area ***M. electrae***

3. Male anal segment with two symmetrical processes (Fig. 11). Vertex and frons short (1.5:1 and 2:1 length-width, respectively). Small species: 3.4 mm 4
 – Male anal segment without processes (Fig. 25). Vertex and frons longer (2:1 and 2.5:1 length-width, respectively). Large species: 4 mm 5

4. Processes of male anal segment spiniform (Fig. 11). Aedeagus with thin rhomboid shaped process (Fig. 9). Pygofer with inner lobes rhomboid shaped in outline (Fig. 7). Frons with blackish and whitish stripes, submedian carina forked at the fastigium (Fig. 2). Spur with 10-13 teeth (Fig. 4b) ***M. nigrifasciatus*** sp. nov.
 – Processes of male anal segment digitiform. Aedeagus with long strong not spine-like apical closely curved dorsobasad directed on left process. Pygofer with inner lobes rounded in outline and a small peg-like projection on ventral surface between inner lobes. Frons uniformly colored, submedian carina forked below the anterior eye margin. Spur with 18 teeth ***M. timehri***

5. Male anal segment collar like. Aedeagus with two apical processes. Pygofer with inner lobes rectangular in outline. Dorsal margin of diaphragm medially rectangularly produced.

Female: sternite VII finely denticulated medially on external surface. Gonapophysis IX with conspicuous truncated and dorsally denticulated teeth on the apical half ***M. scutellaris***
 – Male anal segment pointed or excavated on medio-ventral margin of apex (Fig. 25). Aedeagus with one apical or subapical process (Fig. 23). Pygofer with inner lobes sinuous or rounded in outline (Fig. 21). Dorsal margin of diaphragm not rectangularly produced (Fig. 20). Female: sternite VII with a medial projection on external surface (Fig. 26). Gonapophysis IX with small and fine teeth on the apical half (Fig. 28) 6

6. Male anal segment pointed on medio-ventral margin of apex, anal style medium length (2:1 length-width, respectively). Aedeagus with apical process on right. Pygofer with inner lobes sinuous in outline, ventral margin narrowly notched between them. Dorsal margin of diaphragm medially widely rounded, produced. Female: sternite VII with a tongue-like projection. Gonapophysis IX curved at base. Frons brown and uniformly colored ***M. iphigeniae***
 – Male anal segment strongly excavated at apex on ventral margin and borderer (Fig. 25), anal style long (4:1 length-width respectively). Aedeagus with subapical process on left (Fig. 23). Pygofer with inner lobes rounded in outline, ventral margin widely notched and depressed between them (Fig. 21). Dorsal margin of diaphragm medially semiconical produced and truncate apically (Fig. 20). Female: sternite VII with a lobed small projection (Fig. 26). Gonapophysis IX slightly curved at base (Fig. 28). Frons spotted and striped. (Fig. 16) ***M. maculipes*** comb. nov.

ACKNOWLEDGMENTS

We thank Axel Bachman (Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires (FCEyN) for the loan of specimens and Guillermo Cabrera for critical and grammatical revision. This work was supported by the FuEDEI, Facultad de Ciencias Naturales y Museo (UNLP) and Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET) from Argentina.

LITERATURE CITED

- BARTLETT, C. R. 2009. Diversity in New World Stenocranine Planthoppers (Hemiptera: Delphacidae). *Transactions of the American Entomological Society* 135: 443-486.
- BEAMER, R. H. 1955. A revision of the genus *Megamelus* in America North of Mexico (Homoptera, Fulgoromorpha, Delphacidae). *Journal of the Kansas Entomological Society* 28: 29-46.
- BERG, C. 1879. Hemiptera Argentina enumeravit speciesque novas descripsit. *Anales de la Sociedad Científica Argentina* VIII: 9-316.
- BERG, C. 1883. Addenda et emendanda ad Hemiptera Argentina. *Anales de la Sociedad Científica Argentina* XVI: 1-294.
- BONETTO, A. A. & S. HURTADO. 1998. *Wetlands of South America. An agenda for biodiversity conservation and policies development*. A publication of Wetland International Buenos Aires, Argentina: Wetlands International SRNyDS Publ.
- CRAWFORD, L. 1914. A contribution toward a monograph of the homopterous insects of the family Delphacidae of North and South America. *Proceeding of the United States National Museum* 46: 557-641.
- DOZIER, H. L. 1922. A synopsis of the genus *Stenocranus*, and a new species of *Mysidia* (Homoptera). *The Ohio Journal of Science* VIII: 69-82.
- FITZGERALD, D. & P. W. TIPPING 2013. Effect of insect density and host plant quality on wing-form in *Megamelus scutellaris* (Hemiptera: Delphacidae). *Florida Entomologist* 96: 124-130.
- METCALF, Z. P. 1943. *General Catalogue of the Hemiptera. Fascicle IV Fulgoroidea Part 3 Araeopidae (Delphacidae)*. Smith College, Northampton, Massachusetts, U.S.A., 549 pp.
- SOSA, A. J., A. M. M. de REMES LENICOV, R. MARIANI & H. CORDO. 2004. Redescription of *Megamelus scutellaris* Berg (Hemiptera: Delphacidae), a candidate for biological control of water hyacinth. *Annals of the Entomological Society of America* 97: 271-275.
- SOSA, A. J., A. M. M. de REMES LENICOV, & R. MARIANI. 2007a. Species of *Megamelus* Fieber (Hemiptera: Delphacidae) associated with Pontederiaceae in South America. *Annals of the Entomological Society of America* 100: 798-809.
- SOSA, A. J., H. A. CORDO & J. SACCO. 2007b. Preliminary evaluation of *Megamelus scutellaris* Berg (Hemiptera: Delphacidae), a candidate for biological control of waterhyacinth. *Biological Control* 42: 129-138.
- TIPPING, P. W., T.D. CENTER, A. J. SOSA & F. A. DRAY. 2011. Host specificity assessment and potential impact of *Megamelus scutellaris* (Hemiptera: Delphacidae) on waterhyacinth *Eichhornia crassipes* (Pontederiales: Pontederiaceae). *Biocontrol Science and Technology* 21: 75-87.